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| Breakout 6: Day Thursday (before Lunch): Connecting Our Learning | |  |
| 105 min | Math Learning Goals   * Participants will demonstrate an understanding of the importance of the number line and how understanding its structure and meaning helps students to develop a better understanding of fractions * Participants will engage in number line activities that move from whole number to fractional thinking * Participants will recognize how the number line is different from other fractional representations, and the advantages that can be gained by using the number line | Materials   * Lines on chart paper * Adding machine tape * Markers |
|  | 🡪 Whole number thinking on number lines  In Pairs  Participants are given a line and asked to make it represent numbers from 1 to 100. Next they are given the same length line which now represents numbers 1 to 10.  Whole Group  Groups share their strategies for partitioning their number lines. The group then brainstorms on the difficulties young children have when making a number line.  ( thinking sequentially and not proportionately, labelling the spaces instead of the ticks) |  |
| Minds On…  15 minutes |
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|  | 🡪Fractional Thinking on Number Lines Using Adding Machine Tape  In Pairs  Participants fold their adding machine tape in half. Label with a coloured marker 0/2, ½, 2/2  Participants now tri fold their adding machine tape. This requires some skill and direction. Explain that it is like folding a letter to put in an envelope. Have them label with a different coloured marker, 0/3, 1/3, 2/3, 3/3  Continue this process through the fourths, fifths, sixths, through 10/10. Use a different coloured marker for each of the different denominators.  **Extension**  Find the fractions with odd denominators. 7ths and 9ths are difficult for the students to solve. As a last resort, you can take the 48 inches and divide it into equal parts using a ruler. Try however to get the students to fold the strip. For instance, 9ths can be found by folding the thirds into thirds. Have them develop strategies to find each of the common fractions with denominators 10 or less.  **Whole Group**  1. Have a discussion about   * the denominators (or fractional names) and how they are positioned on the number line * how this activity would help with equipartitioning and understanding the relative size of fractions   2. Check for Understanding – have a number line with the numbers marked 0, ½, and 1. Give each pair of participants a fraction (can be in words) and they decide whether it is closest to 0, ½, or 1. As a whole group, place the fractions on the number line, giving explanations (Participants may refer to their adding machine tape for assistance)  **Differentiation**: Have participants use a strip equal in length to their height. In others words, give a 5’ 2” student a 62 inch strip and have them mark the fractions as described above. What fraction of their height are their eyes? Fingertips? Knees?  (Ordering tangrams on a number line?) |  |
| Action! |
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|  | 🡪 Check for Understanding  Have participants write out directions on index cards (one card for each denominator) to instruct another person how to construct the fraction number line on adding machine tape. How is the strategy for finding 5ths different for finding 6ths or 8ths?  **Reflection**  What mathematical concepts can be reinforced by using the number line?  (temperature on thermometers, measurement, historic timelines) |  |
| Consolidate Debrief |
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|  | Home Activity or Further Classroom Consolidation |  |

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| Unit #: Day #: (Title) | | Grade |
| **Time Bar:**  Indicate the timing for each section. | Math Learning Goals   * Two or three math learning goals for this lesson. | Materials   * list materials required |
|  | Identify Grouping 🡪 Strategy  Get students mentally engaged in the first minutes of the class and establish a positive classroom climate, making every minute of the math class count for every student.   |  |  | | --- | --- | | *Connect to careers*  *Connect to other strands*  *Connect to previous lesson*  *Connect to student interest*  *Orient students to an activity*  *Orient students to materials* | *Develop interpersonal skills*  *Develop learning skills*  *Introduce a problem*  *Do a motivating activity*  *Pose a question*  *Reflect on prior learning*  *Connect to previous group of lessons* | | Plan links between assessment and instruction:  1) Identify what will be assessed (curriculum expectations or learning skills).  2) Choose an appropriate assessment strategy.  3) Choose an appropriate assessment scoring tool. |
| Minds On… |
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|  | Identify Grouping 🡪 Strategy  **Students** domathematics: fearless talking and listening, reflecting, discussing, observing, investigating, representing, reasoning, selecting tools and computational strategies, developing understanding, valuing mathematics, constructing concepts, demonstrating concepts, applying concepts, discovering relationships, exploring, hypothesizing, building algorithmic skills, etc.  **Teachers** plan appropriate student groupings and strategies, pose questions to expose thinking, listen carefully, observe, offer prompts when necessary, respond to provide appropriate scaffolding and challenge, etc.  **NOTE: Icons in sidebar** ( e.g. ) **can be copied into your TIPS 2.0 template.** | Explicitly label:   * *Assessment* ***for*** *learning*  (inform future instruction)  * *Assessment* ***as*** *learning*  (reflection)  * *Assessment* ***of*** *learning*  (student achievement). |
| Action! |
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|  | Identify Grouping 🡪 Strategy  “Pull out the math,” check for conceptual understanding, and prepare students for the follow-up activity or the next lesson. Often this involves whole class discussion and sharing. Students listen to and contribute to reflections on alternate approaches, different solutions, extensions, and connections.  **Note:** Students should be well prepared to do mathematics individually after the three-part lesson. | Explicitly identify planned differentiation of content, process, or product based on readiness, interest, or learning preference in order to work in zone of proximal development; save time; give students choice, …  Provide hyperlinks to:   * Rationale/research  * Video  * Lesson artefacts  * Professional  dialogue |
| Consolidate Debrief |
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| <Choose relevant label(s)>  Application  Concept Practice  Differentiated  Exploration  Reflection  Skill Drill | Home Activity or Further Classroom Consolidation  Provide meaningful and appropriate follow-up. Choose activities that consolidate understanding, build confidence in doing mathematics independently, help parents see the types of math activities students engage in during class and see connections between the mathematics being taught and life beyond the classroom. Give students some choice through differentiated activities. | Your plan should include activities that are:   * visual * kinesthetic * auditory |



For an annotated example, please see *Mathematics GAINS –Professional Learning Series Facilitator’s Guide*, pdf, page 5